



# Dr. Ambedkar College

## Deekshabhoomi, Nagpur



RE-ACCREDITED WITH 'A' GRADE BY NAAC CGPA: 3.45  
RECOGNIZED AS COLLEGE WITH POTENTIAL FOR EXCELLENCE BY UGC

## Report

### Practical Oriented Certificate course on “Instrumental Techniques and Analysis”

Organized by  
Department of Chemistry

(Session: 2022-23)


The department of chemistry of Dr. Ambedkar College, Deekshabhoomi, Nagpur organized thirty hours duration practical oriented certificate course on “Instrumental Techniques and Analysis” during the session 2022-23. A total of **41 undergraduate students** of Chemistry participated in the course. The course is completed through series of lectures and laboratory sessions by resource persons and educational visits to scientific research institutes.

The certificate course covered the following topics-


- Instrumental methods of analysis, their classification and advantages of instrumental methods, limitations, sensitivity and detection limits, precision and accuracy, Calibration of glassware.
- Theory, working and applications of instrumental techniques for analysis: UV-Visible Spectrophotometer, FT-IR Spectrometer, XRD diffractometer, NMR Spectrometer, Mass Spectrometer, Flame photometer, pH meter, Colorimeter, Potentiometer, Conductometer, Nephelometer, Amperometer, SEM, EDAX, TEM, Atomic Absorption Spectrophotometer (AAS).
- Basics of Chromatographic methods: Liquid chromatography, Partition, Ion exchange, Paper, Thin layer, Column, Gel chromatography, GC, GC-MS, HPLC, HPLC-MS & HPTLC.
- Sampling of water: Definition, types of samples, sampling plan, quality of sample, sample registration and storage, Preparation of indicators, reagents and standard solutions, analysis of drinking water quality and physico-chemical parameters of drinking water.

**Day-1:**  
**Inauguration and Keynote address**  
**(19<sup>th</sup> November 2022)**  
**Time: 11.00 AM to 02.00 PM**

The inauguration ceremony of practical oriented certificate course on “Instrumental Techniques and Analysis” was organized on on 19<sup>th</sup> November 2022 at 11.00 AM by the hands of Dr. Dr. Upendra Singh, Senior Principal Scientist, Jawaharlal Nehru Aluminium Research Development and Design Centre, Nagpur. Dr. Rajdeep Utane . Assistant Professor and HOD, Department of Chemistry, Sant Gadge Maharaj Mahavidyalaya, Hingna was also present as a Keynote speaker during the inaugural session. The registered students attended the event. Dr. Mrs. B. A. Mehere, Pricipal of the college delivered the welcome address and Dr. D. Y. Panhekar, Head of the Department explained about the certificate course. Dr. Upendra Singh, who inaugurated the event, expressed that this certificate course was one of the few initiatives aimed at capacity building in instrumental techniques and analysis skill required for chemistry students. He applauded the idea and congratulated the stakeholders. Dr. Rajdeep Utane, Assistant Professor and HOD, Department of Chemistry, Sant Gadge Maharaj Mahavidyalaya, Hingna delivered the keynote address and explained the importance of instrumental techniques in chemistry through power point presentation. Dr. N. G. Telkapalliwar, Professor and Course co-ordinator conducted the programme and also explained the aim and objectives of the certificate course and expressed gratitude to all the stakeholders who contributed to this certificate course and execution.



**Dr. Ambedkar College**  
Deekshabhoomi, Nagpur




**Department of Chemistry**

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**Inauguration of Practical Oriented Certificate Course On**  
**“Instrumental Techniques and Analysis”**

**Chief Guest**




**Dr. Upendra Singh**  
Senior Principal Scientist  
Jawaharlal Nehru Aluminium  
Research Development and  
Design Centre, Nagpur

**19<sup>th</sup> November 2022**



**Invited Speaker**



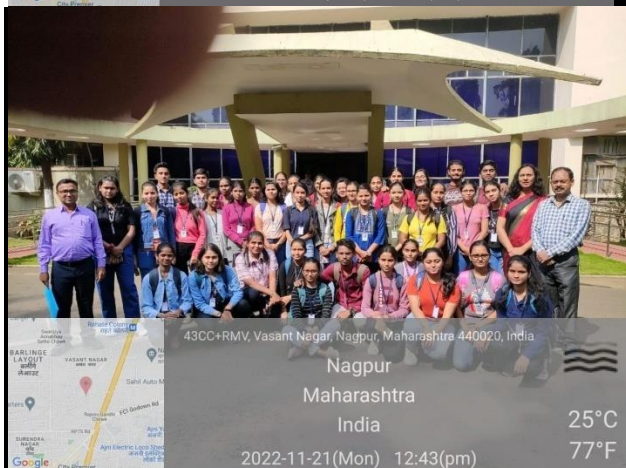
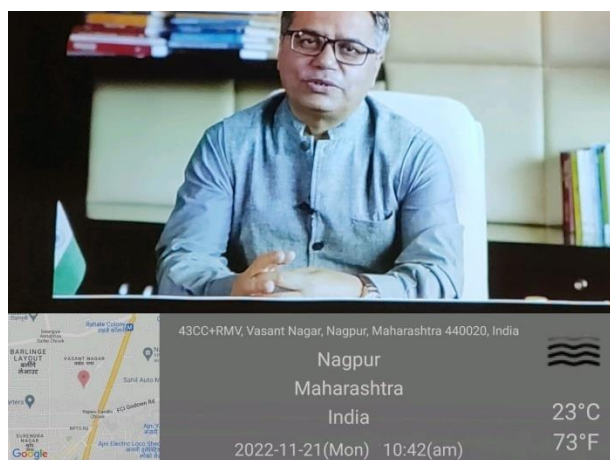
**Dr. Rajdeep Utane**  
Assistant Professor and HOD  
Department of Chemistry,  
Sant Gadge Maharaj Mahavidyalaya,  
Hingna, Nagpur

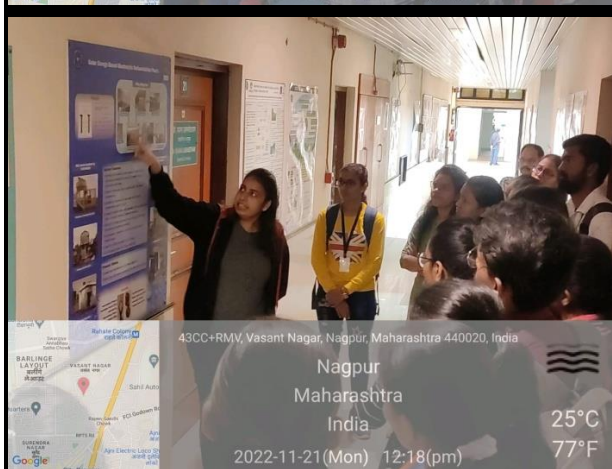
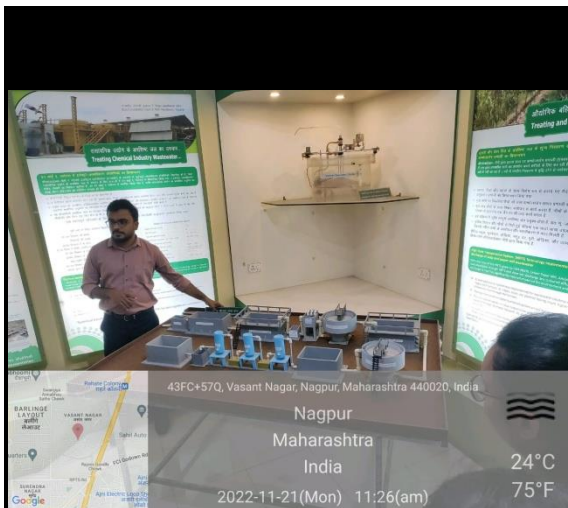
## Photographs of Inaguration Programme



**Day-2:**  
**Educational Visit to CSIR-National Environmental Engineering Research  
Institute (CSIR-NEERI), Nagpur**  
**(21<sup>st</sup> November 2022)**  
**Time: 09.00 AM to 02.00 PM**

The educational visit was organized for the registered students of practical oriented certificate course to CSIR-National Environmental Engineering Research Institute (CSIR-NEERI), Nagpur on 21<sup>st</sup> November 2022. CSIR-NEERI operates as a pioneering laboratory in the field of environmental science and engineering and is one of the constituent laboratories of the Council of Scientific and Industrial Research (CSIR). The scientist and research associates working in the NEERI were explained the objectives of NEERI during the educational visits through audio and video presentation such as Conducting research and developmental studies in the field of environmental science and engineering, Providing assistance to industries in the region, as well as local bodies, in addressing environmental pollution issues, Collaborating and interacting with academic and research institutions in the field of environmental science and engineering for mutual benefits, Participating in CSIR's thrust area and mission projects related to the environment. The students visited the different divisions of NEERI and interacted with Ph.D scholars, Project associates and senior scientists of the respective divisions. The visit was co-ordinated by Dr. N. G. Telkapalliwar, Dr. D. M. Borikar and Dr. V. M. Shivankar.





**Day-3:**  
**Educational Visit to ICAR-National National Bureau of Soil Survey  
and Land Used Planning, (ICAR-NBSS & LUP), Nagpur**  
**(22<sup>nd</sup> November 2022)**  
**Time: 09.00 AM to 02.00 PM**

The second educational visit was organized for the registered students of practical oriented certificate course to ICAR-National National Bureau of Soil Survey and Land Used Planning, (ICAR-NBSS & LUP), Nagpur on 22<sup>nd</sup> November 2022. NBSS & LUP is a prestigious research institute of ICAR situated at Nagpur. NBSS & LUP conduct soil survey and mapping of the soils of the country to promote scientific and optimal land use programmes in collaboration with relevant institutions and agencies.

NBSS & LUP conduct and promote research in the National Agricultural Research System in the areas of Pedology, Soil survey, Remote sensing applications, Land degradation, Land evaluation and Land use planning and to impart training and education to create awareness on soil and land resources and their state of health.

The students visited to different laboratories at which students interacted with the scientists and discussed about the physical, chemical and instrumental analysis used in soil analysis. The students were acquainted with the modern tools and techniques of soil survey, soil correlation and classification, application of Geographical Information System (GIS) and remote sensing data, techniques for development of soil health card, etc. during the visit. The visit was co-ordinated by Dr. N. G. Telkapalliwar, Dr. D. M. Borikar and Dr. V. M. Shivankar.



**Day-4:**  
**Theory and Practical**  
**(08<sup>th</sup> April 2023)**  
**Time: 11.00 AM to 05.00 PM**

**Resource Person: Dr. Pradeep Hirapure**

**Theory lecture: 11.00am to 1.00pm**  
**(Topics: Electrophoresis, SDS PAGE, PCR & their applications)**

**Practical:1.00pm to 5.00pm ( Performed Agarose electrophoresis and developed DNA fingerprint, visualisation using Gel Documentation System, Demonstration of PCR reaction using Biorad Thermocycler)**







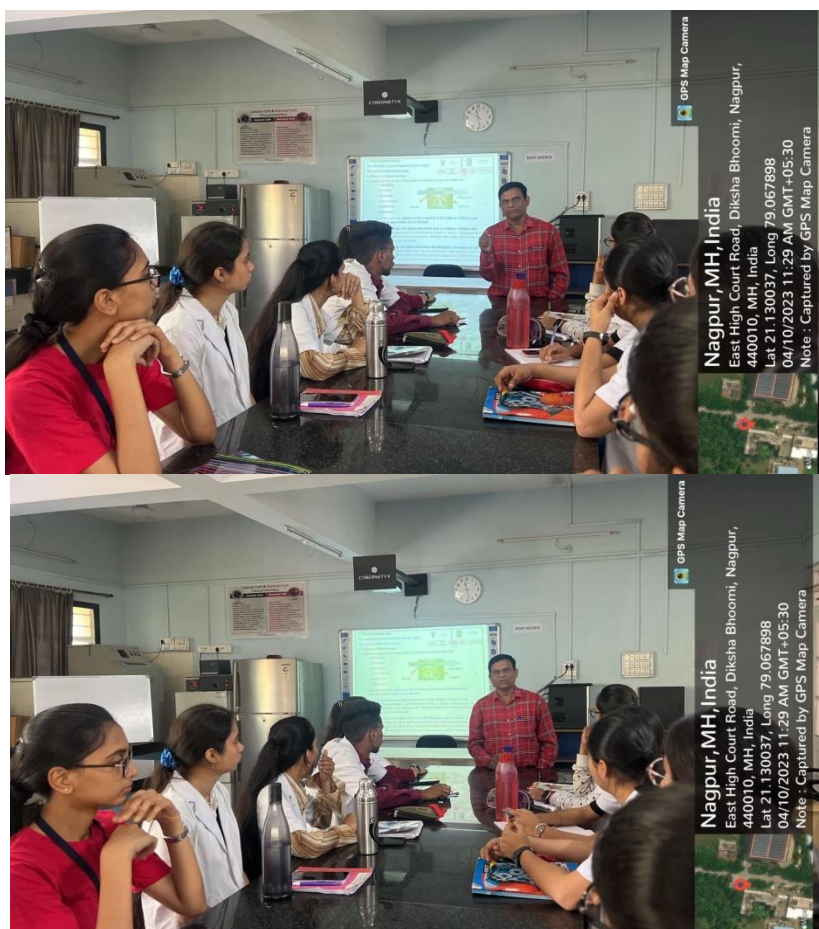
**Day-5**  
**Theory and Practical**  
**(10<sup>th</sup> April 2023)**  
**Time: 11.00 AM to 05.00 PM**

**Resource Person: Dr. Pradeep Hirapure**

**Theory Lecture: 11.00 to 12.00am**

**(Topic: principle , instrumentation and application of UV -visible Spectrophotometer**

**Practical: 12.00am to 5.00pm performed quantitative assay of BSA using UV Visible spectrophotometer of Simadzu pvt ltd.**



**Day-6**  
**Theory and Practical**  
**(11<sup>th</sup> April 2023)**  
**Time: 11.00 AM to 05.00 PM**

**Resource Person: Dr. Parag Panse**

**Theory and Practical : 11.00 to 12.00am**

**Quantitative Analysis of Commercially Available Drugs using  
Colorimetrically/Spectrophotometrically**





**Day-7:**  
**Theory and Practical**  
**(12<sup>h</sup> April 2023)**  
**Time: 09. AM to 03.00 PM**

**Resource Person: Dr. R. C Sawant**

Topics: Basics of Chromatographic methods: Liquid chromatography, Partition, Ion exchange, Paper, Thin layer, Column, Gel chromatography, GC, GC-MS, HPLC, HPLC-MS & HPTLC.

**Practicals topics covered:**

- 1. Basic Introduction to TLC**
- 2. Solvent Systems for analysis of TLC**
- 3. Spot Analysis**
- 4. How to run TLC with precaution**
- 5. Use of Capillary while taking spot of solutes**
- 6. Polarity of different solvent systems**
- 7. Non polar to polar solvents application in analysis of progress of organic reaction**
- 8. Use of UV chamber on analysing compounds**
- 9. Cutting of tlc plates**
- 10. Preparation of different solvent system**





## Sample Certificate



Param Poojya Dr. Babasaheb Ambedkar Smarak Samiti's

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CERTIFICATE

This certificate is awarded to Mr./Ms. ***Yashica Dhiraj Chawla*** of Dr. Ambedkar College, Deekshabhoomi, Nagpur on successful completion of the **“Practical Oriented Certificate Course on Instrumental Techniques and Analysis”** organized by Department of Chemistry, Dr. Ambedkar College, Deekshabhoomi, Nagpur during the session 2022-23. Total course duration was 30 hours.



(Dr. N. G. Telkapaliwar)

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Course Co-ordinator



(Dr. Mrs. D. Y. Panhekar)

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Head, Dept. of Chemistry



(Dr. Mrs. B. A. Mehere)

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Principal